



**Microsoft/Philips Study Shows  
Rampant Interference will be caused to TV Viewers  
by Personal/Portable Unlicensed White Spaces Devices**

On September 20, Microsoft and Philips submitted results of field tests conducted in the New York and California area to the Federal Communications Commission (FCC). Microsoft/Philips states the studies “found that white spaces devices detected television signals at a level of -114 dBm or stronger with 100% accuracy.” Microsoft asserts “that this testing demonstrates that a detection threshold of -114 dBm for personal/portable white space devices will protect viewable TV signals.”<sup>1</sup> In fact, these tests prove just the opposite. The Microsoft/Philips test data demonstrate that at six of the eleven California sites tested – the white space device failed to detect a viewable TV signal. The result would have been operation of the unlicensed device on that channel and interference to TV viewers at that site and beyond.

Microsoft/Philips allege that the so-called White Spaces Coalition position is:

“A TV receiver is to be protected only if it receives a viewable signal at its antenna input port (*e.g.*, a signal above -84 dBm, the receiver’s TOV –Threshold of Visibility) and is within the protected contour.”

However, as shown below, the data submitted to the FCC by Microsoft shows that this standard is clearly not met.

**Microsoft/Philips Test Data.** No specific measurement data was submitted for the New York tests.<sup>2</sup> In addition, all but one of the New York sites appear to be located outside the contour of the one television channel tested. Therefore, this paper will focus on the California measurement data that was submitted in the Microsoft/Philips presentation.

The California tests took measurements on three television channels (25, 30, and 38) at 12 different test locations or test sites. One test location (test site I) was beyond the protected contour on all three channels and therefore is not considered. The data from the California tests is labeled “discone” and “monopole” referring to two different antennas that have been shown with the Microsoft devices. Measurements with each of these

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<sup>1</sup> See Ex Parte letter from Craig Mundie to Chairman Martin.

<sup>2</sup> The New York data was represented only by “bar graphs” and a summary table of detection success or failure.

antennas are presented for each measurement sites. The presumption is that two devices were used for the tests. The use of the term WS device #1 refers to the discone device data and WS device #2 refers to the monopole device data.

The following is a summary of the measurements for each test site. The table shows whether there was a “viewable signal” available to a TV receiver. For this purpose, it is assumed that the TV receiver’s “antenna input” would be connected to a typical consumer television antenna with a gain of about 10 dB.<sup>3</sup> The table also identifies whether there was successful detection, i.e., the white spaces device correctly recognizes that a viewable signal is available at the site or the site is within the protected contour. In addition, the number of times or trials the devices failed to accurately predict is also provided.

Site	TV Channel	Site Inside Protected Contour	Viewable TV Signal Available at Site	Detection		Number of Trials where Detection Failed
				WS Device #1	WS Device #2	
B	38	YES	NO	PASS	FAIL	4 trials failed
C	38	YES	YES	FAIL	FAIL	14 trials failed
D	25	NO	YES	PASS	FAIL	5 trials failed
	30	YES	YES	FAIL	FAIL	16 trials failed
E	30	YES	YES	PASS	FAIL	13 trials failed
	38	YES	YES	FAIL	FAIL	22 trials failed
F	38	YES	YES	PASS	FAIL	8 trials failed
G	25	YES	YES	PASS	FAIL	5 trials failed
	30	YES	NO	FAIL	FAIL	18 trials failed
	38	YES	NO	FAIL	FAIL	25 trials failed
H	25	YES	YES	PASS	FAIL	10 trials failed

**Failure Examples.** The following are some examples of what the above failures would mean in practical terms.

Example 1. Site C is a high rise condominium. The building has a viewable signal on the roof of the building on channel 38 and the building is located within the protected contour of channel 38. However, both personal/portable devices in Apartment 7B fail to “sense” that the devices are within the contour and that there is a viewable signal nearby

<sup>3</sup> This gain can readily be achieved with a roof top TV antenna or an inexpensive amplified indoor antenna such as RadioShack’s Amplified HDTV Indoor/Outdoor Antenna which is specifically marketed for use in areas with size restrictions such as apartments.

and incorrectly indicate that the channel can be used. The result is interference throughout the building and surrounding neighborhood on channel 38.

Example 2. Site E is a residence in the San Marco area located within the protected contour of channel 30. A TV receiver in the guest bedroom would receive a viewable TV signal on channel 30. An unlicensed device in the family room or living room, however, would incorrectly sense that this channel is unoccupied and available. The result is interference to the TV in the guest bedroom – but more importantly to neighbors and residences in the surrounding neighborhood.

Example 3. Site G is a LaQuinta Motel in Vista, California within the protected contour of channel 25. At this location, TV sets located in Rooms 203 and 318 would receive a viewable TV signal on channel 25. However, a personal/portable device in Room 137 would indicate that this channel is unoccupied and available for its use. The result is interference to viewable TV signals in Rooms 203 and 318 as well as the surrounding area.

Example 4. Site H is a residence in Escondido within the protected contour of channel 25. A viewable TV signal is available in the bedroom and on the two balconies. An unlicensed personal/portable in the living room would fail to detect this signal and indicate that this channel is available for use. The result again is interference to a viewable TV signals within the residence and throughout the surrounding neighborhood.

**Summary.** As can be seen from the above Table, the devices failed to correctly detect in 122 trials where there was a viewable television signal or the device was within the protected contour of the TV station. The Table also shows that these failures occurred in seven of the eleven Microsoft “handpicked” sites. The result as shown in the simple example above is interference at the site and throughout the surrounding area.

This is far from the promise of 100% protection for consumers and TV viewers.

We urge the FCC to carefully review these results submitted by Microsoft and Philips because the only conclusion that can be drawn from this data is that these devices do not work and will not protect TV consumers and viewers.